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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,728	01/15/2002	John J. Williams JR.	51462	8646

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THE LAW OFFICE OF KIRK D. WILLIAMS
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EXAMINER
MATTIS, JASON E

ART UNIT	PAPER NUMBER
2616	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	Applicant(s)
Office Action Summary	10/051,728	WILLIAMS ET AL.
	Examiner	**Art Unit**	
	Jason E. Mattis	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on ˙07 November 2006.

2a) ☐ This action is **FINAL.**　　　2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *12,13,15-22 and 31-42* is/are pending in the application.

　　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *12-13, 15-22, and 31-42* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

　　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　　a) ☐ All　b) ☐ Some * c) ☐ None of:

　　　　　1. ☐ Certified copies of the priority documents have been received.

　　　　　2. ☐ Certified copies of the priority documents have been received in Application No. _____.

　　　　　3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)　　　　4) ☐ Interview Summary (PTO-413)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)　　　Paper No(s)/Mail Date. _____ .
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)　　　5) ☐ Notice of Informal Patent Application
　　Paper No(s)/Mail Date _____ .　　　　　　　6) ☐ Other: _____ .

DETAILED ACTION

1.   This Office Action is in response to the amendment filed 11/7/06. New claims

34-42 have been added. Claims 12-13, 15-22, and 31-42 are currently pending in the

application.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 12-13, 15-22, and 31-33 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Giacopelli et al. (U.S. Pat. 4,893,304) in view of Clarke et al. (U.S.

Pat. 4,967,345).

     With respect to claims 12, 19, 33, and 42, Giacopelli et al. discloses a method

and apparatus for mapping packets during a current forwarding cycle in a packet

switching device **(See the abstract of Giacopelli et al. for reference to a packet**

switch performing a method to map packets during a switching cycle). Giacopelli

et al. also discloses for each particular packet of a plurality of packets stored in a

recirculation buffer causing the particular packet to be sent over the current particular

path in response to determining that the particular packet can be sent over the current

particular path based on a path occupancy of the current particular path **(See column 4**

line 29 to column 5 line 54 and Figure 1 of Giacopelli et al. for reference to a

group of packets being stored in recirculation loops 30, which together are a

recirculation buffer, for reference to determining whether the packet can be sent

over a current path to a destination port based on destination information in the

packet and based on whether the path to the destination port is already assigned

to another packet for the current packet switching cycle for, meaning the

determining is based on path occupancy of the current path, and for reference to

sending the packet over the path if the packet wins contention for the path).

Giacopelli et al. further discloses advancing a current particular path to a next path not

already mapped for forwarding a packet during the current forwarding cycle **(See**

column 5 line 55 to column 6 line 24 to repeating the process of assigning

packets to paths for each path, meaning after the first path is assigned a packet

for the current packet switching cycle, a next path becomes a new current path).

Giacopelli et al. also discloses after the operation of assigning each particular packet

and while there is at least one path remaining not already mapped for forwarding a

packet during the current forwarding cycle identifying a next packet of a group of input

packets and causing the next input packet to be sent over the current particular path

based on a path occupancy if the next input packet can be sent of the current particular

path **(See column 4 line 29 to column 5 line 54 and Figure 1 of Giacopelli et al. for**

reference to a group of packets being stored in input controllers, for reference to

identifying a packet from the input controllers and determining whether the input

packet can be sent over a current path to a destination port based on destination

information in the input packet and based on whether the path to the destination

port is already assigned to another packet for the current packet switching cycle

for, meaning the determining is based on path occupancy of the current path, and

for reference to sending the packet over the path if the packet wins contention for

the path). Giacopelli et al. further discloses advancing a current particular path to a

next path not already mapped for forwarding a packet during the current forwarding

cycle **(See column 5 line 55 to column 6 line 24 to repeating the process of**

assigning packets to paths for each path, meaning after a current path is

assigned a packet for the current packet switching cycle, a next path becomes a

new current path). Giacopelli et al. also discloses that if the input packet cannot be

sent of the current path, it is moved into the recirculation buffer **(See column 5 lines**

31-54 and Figure 1 of Giacopelli et al. for reference to if all the current paths

available to a destination for a packet have already been assigned to other

packets, moving the packet that loses the contention for the paths into the

recirculation loops). Giacopelli et al. does not disclose logic or one or more computer-

readable media containing computer-executable instruction for performing the method.

Giacopelli et al. also does not disclose generating a random index identifying a current

particular path of a plurality of paths in the packet switching device.

With respect to claim 20, Giacopelli et al. discloses an apparatus for forwarding

information over a plurality of paths **(See the abstract of Giacopelli et al. for**

reference to a packet switch forwarding packets over paths). Giacopelli et al. also

discloses a recirculation buffer to store a first set of packets and an input to receive a

second set of packets **(See column 4 lines 29-42 and Figure 1 of Giacopelli et al. for**

reference to storing a first set of packets in recirculation loops, which are a

recirculation buffer, and for reference to inputs receiving a second set of packets

through input port controllers). Giacopelli et al. further discloses control logic

configured to attempt to forward packets over the paths each packet time from the first

and second sets of packets with preference given to packets in the first set and with the

possible path being chosen based on the number of packets previously assigned to the

paths during the current packet time wherein a packet remains or is added to the

recirculation buffer if not sent over a possible path during a current packet **time (See**

column 4 line 29 to column 5 line 54 and Figure 1 of Giacopelli et al. for reference

to using control logic to attempt to forward packets from both the recirculation

loops and the inputs to possible paths with paths being chosen based on a

number of packets previously assigned for the path in the current forwarding

cycle wherein packets are added to the recirculation loops if it is not possible to

send them over a path to the proper destination during the current forwarding

cycle). Giacopelli et al. does not disclose a random index generator to generate a

random index. Giacopelli et al. also does not disclose that a possible particular path is

determined based on the random index.

With respect to claim 34, Giacopelli et al. discloses an apparatus for mapping

packets during a current forwarding cycle in a packet switching device **(See the**

abstract of Giacopelli et al. for reference to a packet switch performing a method

to map packets during a switching cycle). Giacopelli et al. also discloses a plurality

of paths and a recirculation buffer **(See column 4 lines 12-42 and Figure 1 of**

Giacopelli et al. for reference to routing packets among a plurality of paths and

for reference to storing a first set of packets in recirculation loops, which are a

recirculation buffer, and for reference to inputs receiving a second set of packets

through input port controllers). Giacopelli et al. also discloses for each particular

packet of a plurality of packets stored in a recirculation buffer causing the particular

packet to be sent over the current particular path in response to determining that the

particular packet can be sent over the current particular path based on a path

occupancy of the current particular path **(See column 4 line 29 to column 5 line 54**

and Figure 1 of Giacopelli et al. for reference to a group of packets being stored

in recirculation loops 30, which together are a recirculation buffer, for reference

to determining whether the packet can be sent over a current path to a

destination port based on destination information in the packet and based on

whether the path to the destination port is already assigned to another packet for

the current packet switching cycle for, meaning the determining is based on path

occupancy of the current path, and for reference to sending the packet over the

path if the packet wins contention for the path). Giacopelli et al. further discloses

advancing a current particular path to a next path not already mapped for forwarding a

packet during the current forwarding cycle **(See column 5 line 55 to column 6 line 24**

to repeating the process of assigning packets to paths for each path, meaning

after the first path is assigned a packet for the current packet switching cycle, a

next path becomes a new current path). Giacopelli et al. also discloses after the

operation of assigning each particular packet and while there is at least one path

remaining not already mapped for forwarding a packet during the current forwarding

cycle identifying a next packet of a group of input packets and causing the next input

packet to be sent over the current particular path based on a path occupancy if the next

input packet can be sent of the current particular path **(See column 4 line 29 to**

column 5 line 54 and Figure 1 of Giacopelli et al. for reference to a group of

packets being stored in input controllers, for reference to identifying a packet

from the input controllers and determining whether the input packet can be sent

over a current path to a destination port based on destination information in the

input packet and based on whether the path to the destination port is already

assigned to another packet for the current packet switching cycle for, meaning

the determining is based on path occupancy of the current path, and for

reference to sending the packet over the path if the packet wins contention for

the path). Giacopelli et al. further discloses advancing a current particular path to a

next path not already mapped for forwarding a packet during the current forwarding

cycle **(See column 5 line 55 to column 6 line 24 to repeating the process of**

assigning packets to paths for each path, meaning after a current path is

assigned a packet for the current packet switching cycle, a next path becomes a

new current path). Giacopelli et al. also discloses that if the input packet cannot be

sent of the current path, it is moved into the recirculation buffer **(See column 5 lines**

31-54 and Figure 1 of Giacopelli et al. for reference to if all the current paths

available to a destination for a packet have already been assigned to other

packets, moving the packet that loses the contention for the paths into the

recirculation loops). Giacopelli et al. does not disclose generating a random index

identifying a current particular path of a plurality of paths in the packet switching device.

With respect to claims 12, 19-20, 33-34, and 41, Clarke et al., in the field of

communications, discloses that a particular current path is chosen by generating a

random index to choose a path to be the particular current path **(See column 2 lines**

49-68 of Clarke et al. for reference choosing between multiple paths using a

random operation, meaning a random number is generated to randomly choose

between multiple paths). Choosing a particular current path by generating a random

index has the advantage of allowing packets to be distributed more evenly across

multiple paths to the same destination in a switching element.

It would have been obvious for one of ordinary skill in the art at the time of the

invention, when presented with the work of Clarke et al., to combine choosing a

particular current path by generating a random index, as suggested by Clarke et al.,

with the system and method of Giacopelli et al., with the motivation being to allow

packets to be distributed more evenly across multiple paths to the same destination in a

switching element.

With respect to claims 19 and 41, although Giacopelli et al. does not

specifically disclose using logic and a computer-readable media tangibly embodying

instructions to perform the packet mapping method, using logic and a computer-

readable media tangibly embodying instructions to perform a packet mapping method is

old and well known in the art of communications. It would have been obvious for one of

ordinary skill in the art at the time of the invention, to combine using logic and a

computer-readable media tangibly embodying instructions to perform a packet mapping

method with the system and method of Giacopelli et al., with the motivation being to use

cheap and widely available processing components to implement the packet mapping

method.

With respect to claims 13, 15, 35, and 36, Giacopelli et al. discloses that the

current forwarding cycle corresponds to a packet time corresponding to a round of

sending one packet over each of the paths **(See column 9 line 66 to column 10 line

40 of Giacopelli et al. for reference to the packets being dynamically allocated in a

forwarding cycle corresponding to a packet time slot, which is a round of sending

packets over each path)**.

With respect to claims 16 and 37, Giacopelli et al. discloses that each of the

paths correspond to a different physical plane of a packet switching system **(See

Figures 1A-B of Giacopelli et al. for reference to each path being a different path,

or plane, though a switch to a destination port)**.

With respect to claims 17, 18, 38, and 39, Giacopelli et al. disclose that the

plurality of path either include all the planes of the switching system or does not include

all the plane of the switching system **(Giacopelli et al. inherently discloses that the

plurality of paths assigned to transmit a data packet during a forwarding cycle

would include all the planes of a switching system if a packet exists to be**

transmitted over each plane during the forwarding cycle and that the plurality of

paths assigned to transmit a data packet during a forwarding cycle would not

include all the planes of a switching system if a packet does not exist to be

transmitted over each plane during the forwarding cycle).

With respect to claims 21 and 22, Giacopelli et al. discloses that a packet is not

sent during the current packet time if a destination of the packet is not reachable

according to a data structure containing an indication of whether or not the destination is

reachable **(See column 5 lines 31-54 and Figure 1 of Giacopelli et al. for reference**

to if all the current paths available to a destination for a packet have already been

assigned to other packets, as determined based on a data structure storing an

indication that the possible paths are already assigned, moving the packet that

loses the contention for the paths into the recirculation loops, meaning the

packet is not sent during the current packet time).

With respect to claims 31, 32, 40, and 42, Giacopelli et al. discloses that if a

packet is not determined that it can not be sent over the current part it is moved to the

end of the recirculation buffer **(See column 5 lines 31-54 and Figure 1 of Giacopelli**

et al. for reference to moving packets to the recirculation loops, which are shift

registers, meaning they are moved to the end of the shift register, if the packet

can not be sent over the current path).

Response to Arguments

4.   Applicant's arguments have been considered but are moot in view of the new

ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jason E. Mattis whose telephone number is (571) 272-

3154. The examiner can normally be reached on M-F 8AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

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